



New Ways To Foil Potato Pests

Green peach aphid. (K836-3)

Steamy baked potatoes, crispy french fries, crunchy chips.... Consumers love potatoes from the Pacific Northwest. And so do insects.

With increased regulatory scrutiny of many oft-used pesticides, potato growers are looking for alternatives to keep pests at bay.

ARS researchers at the Yakima Agricultural Research Laboratory in Wapato, Washington, are devising new, integrated strategies to protect potato crops. The biggest concern in the Pacific Northwest is the green peach aphid, says ARS entomologist Lawrence A. Lacey, because the aphid transmits leaf roll and other viruses. Leaf roll virus can decrease yields and turn parts of the potato flesh brown, making it unacceptable for either the fresh or processed market.

Lacey is researching two potential biological control agents: a fungus, *Verticillium lecanii*, and a parasite, *Aphidius colemani*. The fungus is already registered for use against several insects, but there's one complication: The fungus and the parasite may inhibit each other.

"In a different study, my student and I showed that parasites avoided Russian wheat aphids that were infected with fungi and that the fungi were less likely to become established in parasitized aphids," Lacey says. "We're investigating whether the same situation exists with these two organisms in green peach aphids," he says.

Meanwhile, ARS entomologist David R. Horton is evaluating more-selective pesticides. "Right now, growers use broad-spectrum insecticides. But those are the types of

chemicals most likely to face restrictions," Horton says. "If we can find chemicals that control only aphids, for example, they might fit in well with an integrated pest management program that also uses beneficial insects and cultural controls such as crop rotation."

Although such selective products are available, Horton says this approach leaves the door open for secondary pests, such as the Colorado potato beetle. Once a grower stops using systemic insecticides, the beetle could cause significant damage. But right now, the beetle poses a much lesser threat than the aphid.

Lacey has demonstrated that a mixture of the fungus *Beauveria bassiana* and a strain of the bacterium *Bacillus thuringiensis* provides good control of Colorado potato beetle in the Northwest. Further, because the fungus can survive in soil and in the bodies of killed overwintering beetles, the mixture provides better long-term control than the bacterium alone.

By combining basic and applied research, the team hopes to develop a set of tools that give potato growers more options if their preferred methods of defense disappear.—By **Kathryn Barry Stelljes**, ARS.

This research is part of Crop Protection and Quarantine, an ARS National Program (#304) described on the World Wide Web at <http://www.nps.ars.usda.gov>.

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